



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,454	05/24/2006	Hiroshi Abe	ABE	1418
23643	7590	01/24/2007		
BARNES & THORNBURG LLP 11 SOUTH MERIDIAN INDIANAPOLIS, IN 46204			EXAMINER NATALINI, JEFF WILLIAM	
			ART UNIT 2858	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE 3 MONTHS			MAIL DATE 01/24/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/540,454

Applicant(s)

ABE, HIROSHI

Examiner

Jeff Natalini

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/24/06 and 5/24/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to because in figure 3B, the empty boxes 21 and 20 should be labeled object (or a suitable term that applicant would like) in order to make the figure easily recognizable. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

Art Unit: 2858

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7 and 10-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsushita (JP7-60185, disclosed in IDS).

In regard to claim 1, Matsushita discloses a capacitance detecting proximity sensor that includes a sensor structure and a sensor circuit and electrostatically detects when a detection subject has come into proximity within a difference threshold (paragraph 4, of the translation disclosed),

wherein the sensor structure houses a first detection electrode and a second detection electrode that are disposed in mutual proximity in a predetermined geometrical relationship and are mutually electrically independent (figure 2, electrodes are elements 1 and 3),

the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated and configured so that when the detection subject is present in the vicinity of the difference threshold, the electrostatic environmental condition between the detection subject and the first detection electrode and the electrostatic environmental condition between the same detection subject and the second detection electrode are different (paragraph 5),

and the sensor circuit detects and outputs the difference between a capacitance to ground formed by the first detection electrode and a capacitance to ground formed by the second detection electrode (paragraph 5 and paragraph 16 with figure 1).

In regard to claim 2, Matsushita discloses wherein a shield electrode is disposed in the sensor structure so as to surround another portion of the difference threshold vicinity excluding a front side portion of the difference threshold vicinity facing the detection subject, and the first detection electrode and the second detection electrode are electrostatically shielded by the shield electrode excluding the front direction (paragraph 6 and also figure 5b).

In regard to claims 3 and 13, Matsushita discloses wherein the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated so that the spatial distance between the detection subject in the vicinity of the difference threshold and the first detection electrode and the spatial distance between the same detection subject and the second detection electrode are different (figure 2, the distance between subject X and electrode (element 1) is different then the distance between subject X and electrode (element 3)).

In regard to claims 4 and 14, Matsushita discloses wherein the dielectric constants of a first dielectric disposed at the front side of the first detection electrode facing the detection subject and a second dielectric disposed at the front side of the second detection electrode facing the detection subject are made different, whereby the environment in which the first detection electrode and the second detection electrode

are disposed in the sensor structure is differentiated (paragraph 17, second and third sentences).

In regard to claims 5 and 15, Matsushita discloses wherein the second detection electrode is disposed opposite from the front side of the first detection electrode facing the detection subject so that the second detection electrode is hidden from the difference threshold vicinity at a rear portion of the first detection electrode (figure 2, first detection electrode (element 1) is at a front side compared to the second electrode for detection (element 3)), whereby the environment in which the first detection electrode and the second detection electrode are disposed in the sensor structure is differentiated (paragraph 17, second and third sentences).

In regard to claims 6 and 16-19, Matsushita discloses wherein the first detection electrode, the second detection electrode and the sensor structure are configured in band-like shapes (see figures 5a and figure 2).

In regard to claim 7, Matsushita discloses wherein the shield electrode is formed in a rail shape having a substantially U-shaped cross section, with the first detection electrode and the second detection electrode being housed inside the U-shaped groove (figure 5b, wherein the U-shaped electrode is element 4).

In regard to claim 10, Matsushita discloses wherein the first detection electrode and the second detection electrode are divided (see figures 1 and 2), with the shield electrode individually surrounding the divided electrodes (paragraph 6 and figure 5a and b).

In regard to claim 11, Matsushita discloses wherein the sensor circuit includes a first capacitance detection circuit that measures the capacitance to ground of the first detection electrode, a second capacitance detection circuit that measures the capacitance to ground of the second detection electrode, and a difference detection circuit that outputs the difference between the measured outputs of these two capacitance detection circuits (paragraph 16 and figure 1).

In regard to claim 12, Matsushita discloses wherein the first and second capacitance detection circuits are switched capacitor-type capacitance detection circuits (paragraph 16, "electrostatic capacity").

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita (JP7-60185) in view of Melnick (3311696).

Matsushita discloses a U-shaped shield electrode (figure 5b, element 4).

Matsushita lacks specifically wherein metal foil is disclosed on the outer side of the electrode.

Melnick discloses metal foil disposed on an electrode surface (col 5 line 16-23).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Matsushita to include metal foil on the outside of the u-shaped electrode as taught by Melnick in order to provide shielding to the u-shaped electrode (col 5 line 16-18).

6. Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita (JP7-60185) in view of Schoeffthaler et al. (6215318).

In regard to claims 9 and 20, Matsushita lacks wherein the first and second electrodes are formed in a comb shape having teeth and disposed wherein the comb like teeth mesh together.

Schoeffthaler et al. discloses a sensor having electrode combs (col 2 line 50-54) wherein the comb like teeth mesh together (seen in figures 1 and 2).

It would have been obvious to one with ordinary skill in the art at the time the invention was made for Matsushita to include comb like filters wherein the teeth meshed together as taught by Schoeffthaler et al. in order to produce a motion dependent change in capacitance (col 2 line 52-54).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakayama et al. (5638457) discloses a capacitance displacement sensor that has two detection electrodes wherein a difference signal is determined. Ishio (6744258) discloses a capacitive sensor apparatus for physical

Art Unit: 2858

detection using a plurality of detection electrodes. Okushima et al. (7154393) discloses an object detection sensor including two detection electrodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Natalini whose telephone number is 571-272-2266. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on 571-272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeff Natalini



ANDREW H. HIRSHFELD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800